A New Apparatus for Gravimetric Measurement of Solubility by Magnetic Suspension Densimetry*

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A new instrument has been developed to measure the solubility of solids and liquids in supercritical fluids. A magnetic suspension densimeter was designed to measure saturated fluid densities and solubilities in binary systems. The densimeter float was designed as a solute holder to measure the mass of solute in solution at saturation. The apparatus also serves as a densimeter when the force on a constant volume float is measured. In this apparatus, an analytical balance is magnetically coupled to the float inside a tubular high-pressure cell. The coaxial magnetic suspension was developed for force measurements in a transparent tubular high-pressure cell. The transparent cell allows observation of the suspension stability, the solute disappearance, and spectroscopic measurement of solubility. Solubility data collected gravimetrically by this method will be compared to spectroscopic data. Preliminary data will be presented for the solubility of fluorinated metal chelates and fluorocarbon lubricants in alternative solvents.